

Network for Earthquake Engineering Simulation (NEES): Earthquake Engineering Research Equipment

Program Solicitation

NSF 00-6

DIRECTORATE FOR ENGINEERING

LETTER OF INTENT DEADLINE: March 31, 2000

PROPOSAL DEADLINE: May 11, 2000



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SUMMARY OF PROGRAM REQUIREMENTS

GENERAL INFORMATION

Program Name: Network for Earthquake Engineering Simulation (NEES): Earthquake Engineering Research Equipment

Short Description/Synopsis of Program: The goal of the Network for Earthquake Engineering Simulation (NEES) Program is to provide a networked, national resource of geographically-distributed, shared-use next-generation experimental research equipment installations, with teleobservation and teleoperation capabilities, which will shift the emphasis of earthquake engineering research *from* current reliance on physical testing *to* integrated experimentation, computation, theory, databases, and model-based simulation. NEES will be a collaboratory, i.e., an integrated experimental, computational, communications, and curated repository system, developed to support collaboration in earthquake engineering research and education. The advanced experimental capabilities provided through NEES will enable researchers to test and validate more complex and comprehensive analytical and computer numerical models that will improve the seismic design and performance of our Nation's civil and mechanical systems. NSF plans that the NEES collaboratory will be developed by September 30, 2004, and will be operational through September 30, 2014.

The NEES Program will be developed through a series of solicitations. This solicitation, NSF 00-6, "NEES: Earthquake Engineering Research Equipment," requests proposals to develop the NEES experimental earthquake engineering research equipment portfolio by investing in new and upgraded experimental earthquake engineering research equipment. NSF intends to hold two competitions to complete the NEES research equipment portfolio. This solicitation serves as the Phase 1 NEES equipment competition. A second and similar NEES research equipment solicitation, Phase 2, is anticipated to be released by NSF in FY 2002.

Cognizant Program Officer: Dr. Joy Pauschke, NEES Program Director, telephone (703) 306-1380, fax (703) 306-0290, e-mail: nees@nsf.gov. To ensure that all proposers receive the same information, all questions concerning this solicitation, except for those related to FastLane, will be accepted only by e-mail. Please e-mail questions to nees@nsf.gov and include in the heading "RESEARCH EQUIPMENT SOLICITATION." All questions, except for those related to FastLane, must be received at NSF by March 31, 2000. NSF will post the responses of interest to all proposers on the NSF NEES FAQ web site at: <<http://www.eng.nsf.gov/nees>>.

Applicable Catalog of Federal Domestic Assistance (CFDA) No.: 47.041 – Engineering Grants

ELIGIBILITY

- ◆ **Limitations on the categories of organizations that are eligible to submit proposals:** Proposals may be submitted by U.S. universities and colleges. Collaborative proposals involving more than one organization must be submitted as a single administrative package from the submitting institution, which will serve as the host institution. The host institution will be responsible for the design, purchase, construction, installation, commissioning, and operation of the NEES equipment and for all interactions with the NSF.
- ◆ **Principal investigator eligibility limitations:** The principal investigator must be a full-time faculty member in a department of engineering at the submitting institution. The principal investigator and co-principal investigator(s) may not be principal investigator or co-principal investigator for proposals submitted to the companion NEES solicitation, NSF 00-7, “NEES: System Integration,” when issued.
- ◆ **Limitation on the number of proposals that may be submitted by an organization:** None
- ◆ **Letter(s) of commitment from the host institution and, if necessary, the host site:** The host institution and, if necessary, the host site must commit, in letter(s) signed by authorized organizational representative(s), to the allocation of space and infrastructure on its campus/site for housing and operating the NEES equipment and to providing national, shared-use access to the NEES equipment by the earthquake engineering research community through September 30, 2014.
- ◆ **High performance network access:** The host institution must provide access to a high performance network, such as vBNS (or its successor(s)), Abilene, or others, through September 30, 2014.

AWARD INFORMATION

- ◆ **Types of award anticipated:** Continuing Grant or Cooperative Agreement
- ◆ **Number of awards anticipated:** Up to 19 (see Table 1, “Research Equipment Categories for NEES Earthquake Engineering Research Equipment,” of this solicitation).
- ◆ **Amount of funds available:** Approximately \$50 to \$55 million, subject to availability of funds.
- ◆ **Anticipated date of award:** September 2000 - January 2001
- ◆ **Award duration:** Award date through September 30, 2004

PROPOSAL PREPARATION AND SUBMISSION INSTRUCTIONS

◆ Proposal Preparation Instructions

- **Letter of Intent requirements:** Letter of Intent is required.
- **Preproposal requirements:** None
- **Proposal preparation instructions:** Standard NSF Grant Proposal Guide (GPG) (NSF 00-2).
- **Supplemental proposal preparation instructions:** In addition to the instructions in the GPG, proposals must be prepared in accordance with the supplemental instructions in this solicitation.
- **Deviations from standard (GPG) proposal preparation instructions:** Page limit increased and four appendices authorized.

◆ Budgetary Information

- **Cost sharing/matching requirements:** There is no specific cost sharing requirement under this solicitation. However, proposers should review the eligibility requirements, which will result in institutional commitments of resources through 2014.
- **Indirect cost (F&A) limitations:** None
- **Other budgetary limitations:** See Table 1, “Research Equipment Categories for NEES Earthquake Engineering Research Equipment,” of this solicitation. See also the “Eligible Project Costs” section of this solicitation.

◆ FastLane Requirements

- **FastLane proposal preparation requirements:** FastLane submission is required for cover sheet and project summary only. FastLane submission of the full proposal is not recommended. After FastLane submission of the cover sheet and project summary, print out the cover sheet with the proposal number generated by FastLane and the project summary, and include the cover sheet and project summary with the original and 20 copies of the full paper proposal submission.
- **FastLane point of contact:** FastLane User Support, (703) 306-1142, fastlane@nsf.gov

◆ **Deadline/Target Dates**

- **Letter of Intent Deadline:** Required via e-mail to nees@nsf.gov by March 31, 2000.
- **Full Proposal Deadline:** May 11, 2000, 5:00 PM ET for receipt of paper submission. After FastLane submission of the cover sheet and project summary, print out the cover sheet with the proposal number generated by FastLane and the project summary, and include the cover sheet and project summary with the original and 20 copies of the full paper proposal submission.

PROPOSAL REVIEW INFORMATION

- ◆ **Merit Review Criteria:** Standard National Science Board approved criteria and additional merit review criteria listed in this solicitation.

AWARD ADMINISTRATION INFORMATION

- ◆ **Grant Award Conditions:** GC-1 or FDP III for grants; GC-1 and CA-1 for cooperative agreements
- ◆ **Special grant conditions anticipated:** The host institution and, if necessary, the host site must commit to the allocation of space and infrastructure on its campus/site for housing and operating the NEES equipment and to providing national, shared-use access to the NEES equipment by the earthquake engineering research community through September 30, 2014.
- ◆ **Special reporting requirements anticipated:** Reporting on award performance milestones as specified in the grant letter or cooperative agreement. Awardees will be required to document and report annual operating costs through September 30, 2004.

INTRODUCTION

The Directorate for Engineering of the National Science Foundation (NSF) announces a program to establish the Network for Earthquake Engineering Simulation (NEES). The goal of the NEES Program is to provide a networked, national resource of geographically-distributed, shared-use next-generation experimental research equipment installations, with teleobservation and teleoperation capabilities, which will shift the emphasis of earthquake engineering research *from* current reliance on physical testing *to* integrated experimentation, computation, theory, databases, and model-based simulation. NEES will be a collaboratory,¹ i.e., an integrated experimental, computational, communications, and curated repository system, to support collaboration in earthquake engineering research and education. The advanced experimental capabilities provided through NEES will enable researchers to test and validate more complex and comprehensive analytical and computer numerical models that will improve the seismic design and performance of our Nation's civil and mechanical systems. NSF plans that the NEES collaboratory will be developed by September 30, 2004, and will be operational through September 30, 2014.

The NEES collaboratory will provide end-to-end connectivity supporting two interconnected subsystems: an *operating subsystem* to operate distributed NEES experimental research equipment and provide a curated repository, and a *computational subsystem* to enable computation and distributed simulation for earthquake engineering research. The operating subsystem will interconnect and allow teleobservation and teleoperation of geographically-distributed NEES equipment, with sharing of experimental data and video views in near-real-time. The computational/modeling subsystem will be linked to the operating subsystem to allow researchers to use experimental data to plan experiments (e.g., use actual or simulated seismic data as input to physical testing), analyze the results of experiments, conduct simulations, and visualize data. The collaboratory will provide researchers with remote access to a curated repository of databases, user-developed simulation software, and models for use in model-based simulation and visualization. The NEES collaboratory will form an integrated network that facilitates interdisciplinary collaboration among scientists and engineers, both within the U.S. and abroad. A broad community, including educators, students, practitioners, and public sector organizations, will use the equipment, data, models, and software from NEES.

The NSF NEES web site, at <<http://www.eng.nsf.gov/nees>>, contains links to selected earthquake engineering web sites and information about site visits conducted by NSF to support the preparation of the NSF NEES Program solicitations. Several workshops have been held that focused on various aspects leading to the development of the NEES Program. Proposers may want to consider the recommendations from these workshops in preparing their proposal for this solicitation. Publications available from these

¹ "National Collaboratories: Applying Information Technology for Scientific Research," Committee on a National Collaboratory, National Research Council, National Academy Press, Washington, D.C., 1993.

workshops are listed below and may be accessed through links provided at the NSF NEES web site.

“Assessment of Earthquake Engineering Research and Testing Capabilities in the United States,” Earthquake Engineering Research Institute, Proceedings: Document WP-01A, Summary Report: Document WP-01. September 1995.

“An Experimental Facilities Initiative in Earthquake Engineering: Action Plan for Upgrading, Expansion and Utilization,” Report to NSF, January 1996.

“Developing a National Network with Structural, Seismological, and Coastal Earthquake Engineering Seismic Simulation Facilities,” University of California at Davis, April 1999 (workshop date May 1998).

“Report for a National Science Foundation Workshop for Tsunami Research Facilities,” 1998, NSF Workshop Report.

The NEES Program will be developed through a series of solicitations. NSF intends to hold two competitions to complete the NEES earthquake engineering research equipment portfolio through funding 25-30 NEES equipment awards. This solicitation, NSF 00-6, serves as the Phase 1 competition and anticipates funding up to 19 NEES equipment awards. NSF will maintain a list of Frequently Asked Questions (FAQ) relating to this solicitation, and this FAQ page will be accessible through the NSF NEES web site. A second and similar NEES research equipment solicitation, Phase 2, is anticipated to be released by NSF in FY 2002.

The companion solicitation, NSF 00-7, “NEES: System Integration,” requests proposals to develop the high performance NEES System that will form the NEES collaboratory for earthquake engineering research and networking the NEES equipment. When issued, NSF 00-7 can be found at: <<http://www.nsf.gov/cgi-bin/getpub?nsf007>>. Finally, the companion solicitation, NSF 01-56, “NEES: Consortium Development,” will develop the entity that will provide the leadership, management, and coordination for the NEES collaboratory, when completed. When issued, NSF 01-56 can be found at: <<http://www.nsf.gov/cgi-bin/getpub?nsf0156>>. NEES equipment awardees will be expected to make the NEES equipment available for shared-use access and teleoperation through the duration of the NEES Program, i.e., through September 30, 2014, and to provide such access in agreement with policies to be established by the NEES Consortium.

PROGRAM DESCRIPTION

This solicitation, NSF 00-6, requests proposals to develop the Nation’s NEES equipment portfolio by investing in the design, purchase, construction, installation, commissioning, and operation of new and upgraded experimental earthquake engineering research

equipment that brings next-generation experimental capabilities, instrumentation, and research opportunities to the earthquake engineering community. Proposers requesting NEES equipment are challenged to present a compelling research vision for integrated experimentation with the requested NEES equipment, computation, theory, databases, and model-based simulation that can lead to significant advances in the seismic design and performance of our Nation’s civil and mechanical systems. Requested NEES equipment should provide advanced or unique instrumentation and experimental capabilities over that currently available in the United States to enable testing and validation of more comprehensive and complete analytical and computer numerical models of these systems. NEES equipment should be designed to accommodate an extensive array of sensors with a corresponding data acquisition system and to provide comprehensive databases to validate analytical and computer numerical models for model-based simulation and visualization that will reduce the reliance of earthquake engineering research on physical testing.

Eligible NEES equipment categories under this solicitation include: 1) shake table research equipment; 2) centrifuge research equipment; 3) tsunami/wave tank research equipment; 4) large-scale laboratory experimentation systems, such as reaction wall systems, earthquake load simulation equipment, and response modification experimental equipment; and 5) field experimentation and monitoring installations, such as mobile laboratories and experimental equipment (e.g., for structural and geotechnical experiments) and field experimentation and monitoring sites. Target award information for each of these categories is described in Table 1. A separate proposal is required from an institution for each equipment category and installation. For example, if an institution is planning to propose to construct a shake table and to upgrade or modify an existing centrifuge, then the institution should submit two separate proposals: one for the shake table and one for the centrifuge. Similarly, if an institution is planning to propose two field experimentation installations of different capabilities or application, then two separate proposals should be submitted: one for each installation. Except for field installations, NEES equipment must be located at the submitting, i.e., “host,” academic institution and the host institution will be the “host site” for the NEES equipment. If a field installation will not be located at the submitting institution, then the proposal must describe the off-campus “host site” where the equipment will be located and the submitting institution is the “host” institution.

Table 1. Research Equipment Categories for NEES Earthquake Engineering Research Equipment

Equipment Categories	Target Award Information
A. Shake table research equipment	<ul style="list-style-type: none"> • NSF expects to invest in up to three shake table installations. • NSF estimates up to \$18 million available in this Phase 1 solicitation.
B. Centrifuge research equipment	<ul style="list-style-type: none"> • NSF expects to invest in up to three centrifuge installations. • NSF estimates up to \$6 million available in this

	Phase 1 solicitation.
C. Tsunami/wave tank research equipment	<ul style="list-style-type: none"> • NSF expects to invest in up to two installations. • NSF estimates up to \$4 million available in this Phase 1 solicitation.
D. Large-scale laboratory experimentation systems	<ul style="list-style-type: none"> • NSF expects to invest in up to five installations. • NSF estimates up to \$17 million available in this Phase 1 solicitation.
E. Field experimentation and monitoring installations	<ul style="list-style-type: none"> • NSF expects to invest in up to six installations. • NSF estimates up to \$10 million available in this Phase 1 solicitation.

By September 30, 2004, NSF expects all NEES equipment to be fully operational. NEES equipment awardees will be expected to establish and adhere to performance standards for construction quality, schedule, and cost. Proposals should include timely plans for commissioning of NEES equipment. Equipment should be designed, selected, and installed to minimize operating costs. To facilitate wide use of NEES equipment by the earthquake engineering research community, requested NEES equipment is to be designed for teleobservation and teleoperation. The extent and feasibility of teleobservation and teleoperation capabilities may depend on the equipment. Plans for the effective implementation of teleobservation and teleoperation of the requested equipment will be evaluated in the merit review process. To foster the teleobservation, teleoperation, and shared-use capabilities of the NEES equipment, NEES equipment awardees will work with the NEES Consortium to develop activities to train the earthquake engineering community on use of the equipment. The NEES Consortium will manage and coordinate all outreach, training, and shared-use activities of the NEES equipment through September 30, 2014. The host institution and, if necessary, the host site must commit, in letter(s) signed by authorized organizational representative(s), to the allocation of space and infrastructure on its campus/site for housing and operating the NEES equipment and to providing national, shared-use access to the NEES equipment by the earthquake engineering research community through September 30, 2014. Letter(s) of this commitment must be included in Appendix 1 of the proposal (see the section below on “Appendices”).

The NEES Program seeks to foster the NSF goal of integration of research and education by placing NEES equipment in research-intensive, collaborative learning environments. Integration of NEES equipment into educational activities at the host institution is strongly encouraged; however, this solicitation does not provide funds for curriculum development. For equipment such as field installations that cannot be located at the host institution, NSF expects that use of this equipment and the derived data will be integrated into educational activities at the host institution.

Because NEES equipment will be connected to the NEES collaboratory, the host institution must provide access to a high performance network, such as vBNS (or its successor(s)), Abilene, or others, through September 30, 2014. In Appendix 4 of the proposal, proposers must describe the host institution’s existing high performance

network access, plans to establish a high performance connection from the equipment to the host institution's high performance Internet connection, and the cost estimate required to complete this equipment connection. For field installations, alternative and potentially more cost-effective connections from the equipment to an existing high performance network, rather than through the host institution, may be proposed. NEES equipment awardees are expected to cooperate with and respond to requests for information from the NEES System Integration awardee funded under program solicitation, "NEES: System Integration," (NSF 00-7). NEES equipment awardees are expected to cooperate in NSF-planned activities organized to develop concepts for the NEES collaboratory and networking and for the NEES Consortium organizational and policy development.

In summary, awardees under this solicitation, NSF 00-6, will be responsible for the following:

- managing the design, purchase, construction, installation, commissioning, and operation of the NEES equipment through September 30, 2004, including interactions with all subawardees and consultants;
- providing space and infrastructure on its campus/host site for housing and operating the NEES equipment and providing national, shared-use access to the NEES equipment by the earthquake engineering research community through September 30, 2014;
- providing access to a high performance network, such as vBNS (or its successor(s)), Abilene, or others, through September 30, 2014;
- providing capabilities for teleobservation and teleoperation of the NEES equipment for users outside the host institution;
- integrating the NEES equipment into research and education at the host institution;
- participating in outreach and training activities developed by the NEES Consortium;
- documenting and reporting annual operating costs to NSF through September 30, 2004;
- cooperating with the NEES System Integration awardee through September 30, 2004, to facilitate the interconnection of all NEES equipment installations, the development of the NEES collaboratory, and the development and implementation of NEES data protocols;
- participating in the organizational and policy development of the NEES Consortium; and
- participating in the NEES Consortium to facilitate integrated management, shared-use access, and remote operation of all NEES equipment by the Consortium through September 30, 2014, in accordance with policies to be established by the NEES Consortium.

ELIGIBILITY

Proposals may be submitted by U.S. universities and colleges. Collaborative proposals involving more than one organization must be submitted as a single administrative package from the host institution. The host institution will be responsible for the design, purchase, construction, installation, commissioning, and operation of the NEES equipment and for all interactions with the NSF. The principal investigator must be a

full-time faculty member in a department of engineering at the submitting institution. The principal investigator and co-principal investigator(s) may not be principal investigator or co-principal investigator for proposals submitted to the companion NEES solicitation, NSF 00-7, "NEES: System Integration," when issued. The host institution and, if necessary, the host site must commit, in letter(s) signed by authorized organizational representative(s), to the allocation of space and infrastructure on its campus/site for housing and operating the NEES equipment and to providing national, shared-use access to the NEES equipment by the earthquake engineering research community through September 30, 2014. The host institution must provide access to a high performance network, such as vBNS (or its successor(s)), Abilene, or others, through September 30, 2014.

ELIGIBLE PROJECT COSTS

Eligible project costs requested from NSF under this solicitation are support for the design, purchase, construction, installation, commissioning, and operation of NEES research equipment through September 30, 2004. Funds may be requested for: acquisition of new equipment (either purchased from a manufacturer or built at the site); upgrading existing equipment; instrumentation and data acquisition systems; construction, installation and commissioning; and operating costs through September 30, 2004. Design, materials, construction, installation, and any other costs for physical test specimens that are to be used for research projects are not eligible costs under this solicitation. Direct costs of renovation, modification, or new construction of laboratories or other buildings are not allowable under this solicitation. Costs for on-site assembly of multi-component equipment are eligible. Specialized safety equipment may be purchased where necessary for the safe utilization of the requested equipment. Specialized equipment and software needed to facilitate teleobservation and teleoperation are eligible project costs. NSF will not provide funding for general-purpose office equipment.

Requests for personnel costs, such as for faculty, technical staff, students, and postdoctoral research associates, must include a description of the responsibilities of each person on the project and appropriate justification for that salary request. Support for curriculum development is not eligible. Travel by the principal investigator to two NSF NEES Program meetings per year through September 30, 2004, should be included in the NSF budget request.

NSF plans to set aside funds for networking the awarded NEES equipment sites (NSF 00-6) after the overall NEES collaboratory plan is developed by the NEES System Integration awardee (NSF 00-7) and approved by NSF. The NEES System Integration awardee will work with NEES equipment awardees to finalize the networking concept for the collaboratory. The System Integration awardee may specify site-specific hardware and software necessary for local networking to achieve the goal of the NEES Program for networking each NEES equipment site with the NEES collaboratory. This may include site-specific local networking equipment such as workstations dedicated to networking, specialized processors, NEES equipment interfaces, local area networking within the

NEES equipment installation, the installation's interface with the host institution, and the host institution's high performance interface to the Internet. Such equipment may be supported by NSF, for use specifically for the NEES Program, at a later date as supplements to the NEES equipment awards. Therefore, site-specific local networking equipment should not be included as a budget item on NSF Form 1030 under the proposal section "Budget" or in Appendix 3 of the proposal. Rather, detailed cost estimates for local networking equipment must be provided in Appendix 4 of the proposal as an information item. The host institution's or host site's access to a high performance network is not an eligible project cost under this solicitation.

AWARD INFORMATION

NSF expects to fund up to 19 awards under this solicitation, depending on the quality of proposal submissions and availability of funds. This solicitation does not set aside funds for establishment of a pre-determined number of equipment installations. Approximately \$50 to \$55 million will be available for awards, subject to availability of funds. Information about the expected number of awards and funds available for awards in each equipment category is given in Table 1. Anticipated date of awards: September 2000-January 2001.

LETTERS OF INTENT (Required)

Letters of intent must be submitted by U.S. universities and colleges on behalf of principal investigators via e-mail to nees@nsf.gov by March 31, 2000. Submission of a separate letter of intent is **mandatory** for each proposal planned by the institution to be submitted to this solicitation. The letter of intent should include: title of proposal; the names and affiliations of the principal investigator and co-principal investigator(s); the telephone and facsimile numbers and e-mail addresses of the principal investigator and an authorized organizational representative of the submitting institution; a list of all participating institutions and organizations; and a brief description (not more than 500 words) of the requested NEES equipment. Letters of intent will not be evaluated or used to decide on funding. They are requested to assist NSF in planning the review process. The submission of letters of intent enables NSF to begin choosing panelists before the proposal submission deadline. The receipt of all letters of intent at NSF will be acknowledged by NSF via e-mail to the principal investigator and the authorized organizational representative. NSF will not accept proposals that do not correspond to letters of intent submitted by the due date.

PROPOSAL PREPARATION AND SUBMISSION INSTRUCTIONS

A. Proposal Preparation Instructions

Proposals submitted in response to this program solicitation should be prepared in accordance with the general guidelines contained in the *Grant Proposal Guide* (GPG), NSF 00-2, except as these guidelines are modified below. The complete text of the GPG (including electronic forms) is available electronically on the NSF Web site at: <http://www.nsf.gov/>. Paper copies of the GPG may be obtained from the NSF

Publications Clearinghouse, telephone 301.947.2722 or by e-mail from pubs@nsf.gov. Please note that the page limits specified in this solicitation take precedence over those given in the GPG.

Proposers are reminded to identify the program solicitation number (NSF 00-6) in the program announcement/solicitation block on the NSF Form 1207, "*Cover Sheet for Proposal to the National Science Foundation*." Compliance with this requirement is critical to determining the relevant proposal processing guidelines. Failure to submit this information may delay processing.

The Project Description must not exceed **35 pages**. Figures, including charts, graphs, maps, photographs and other pictorial presentations, are included in this 35-page limit. Non-conforming proposals will be returned without review. References cited, biographical sketches, and Appendices 1-4 are not included in this page limit. The page limit for each appendix is listed in the description of each appendix.

Specifically, a proposal must include the following items (see the GPG as referenced below):

- **Information about Principal Investigators/Project Directors and co-Principal Investigators/co-Project Directors (NSF Form 1225).** This form should be attached to the cover sheet of the original signed proposal copy.
- **List of Suggested Reviewers or Reviewers Not to Include (optional).**
- **Cover Sheet for Proposal to the National Science Foundation (NSF Form 1207).** The cover sheet (along with the project summary) must be submitted electronically through FastLane. The FastLane cover sheet, with the proposal number generated by FastLane and printed on the cover sheet, and the project summary must be included with the original and 20 copies of the full proposal paper submission.
- **Proposals from Institutions in EPSCoR Jurisdictions.** Proposals from institutions in EPSCoR jurisdictions may be eligible for partial support under the EPSCoR Co-funding Initiative. To be considered potentially eligible, a proposal must have a "Certification of EPSCoR Co-funding Eligibility" form (NSF Form 1404) signed by the jurisdiction's NSF EPSCoR Project Director and submitted with the original proposal copy only. Information on how to contact EPSCoR Project Directors regarding certification may be found, along with a working copy of Form 1404 and more information about certification and the Co-funding Initiative, at: <<http://www.ehr.nsf.gov/EHR/EPSCoR/report/cofund.htm>>. EPSCoR co-funding eligibility is kept in confidence by the managing program and is not a factor in the review of proposals.
- **Project Summary (GPG, Section II.D.2), not more than one page in length.** The project summary should serve as an "Executive Summary" and include the research vision, rationale for the equipment, description and capabilities of the equipment,

location of the equipment, and impact of the equipment on the host institution and on earthquake engineering research. A scientifically literate reader should be able to understand the summary. The project summary (along with the cover sheet) must be submitted electronically through FastLane, printed out from FastLane, and included with the original and 20 copies of the full proposal paper submission.

- **List of All Project Participants.** This list must be grouped by organizations (e.g., academic, business/industrial, government, and others), beginning with the submitting organization and including all partners, subawardees, and consultants. List all project participants, including names, professional titles, departments, organizational affiliations, and mailing addresses. (This list is not included in the 35-page limit below.)
- **Table of Contents.** Organize the Table of Contents to follow the outline requested by the proposal format below and not the outline specified by the official NSF Table of Contents in the GPG, Section II.D.3.
- **Project Description (GPG, Section II.D.4) (35 pages maximum).** This section must not exceed 35 pages in length and must contain the following sections, A through J, in the sequence and with the headings shown below. Appendices 1-4 must be included in the proposal and are described in more detail in the section “Appendices” below.

Section A. Results from Prior NSF Support (up to 5 pages). If the principal investigator or co-principal investigator(s) have received NSF funding in the past five years, information on prior awards is required. Please consult the GPG for details. Reviewers will be asked to comment on the quality of the prior work described in this section of the proposal.

Section B. Research Vision and Design of the NEES Equipment (up to 8 pages). This section should present a compelling research vision of the need for the requested NEES equipment: (1) next-generation experimental capabilities and instrumentation provided by the NEES equipment; (2) vision for how the seismic design and performance of our Nation’s civil and mechanical systems will be significantly advanced over the state-of-the-art through integrated experimentation with the NEES equipment, computation, theory, databases, and model-based simulation; (3) three examples of research projects that could be conducted with the NEES equipment to achieve the research vision; and (4) role of the NEES equipment to meet the research goals of the host institution and the earthquake engineering research community.

Describe the design of the requested equipment in sufficient detail for reviewers to evaluate its potential to provide next-generation experimental capabilities and instrumentation for earthquake engineering research. List the major design criteria and performance specifications of the equipment. Full details of the design should not be included here, but should be presented in Appendix 1 of the proposal. Discuss the design of teleobservation and teleoperation capabilities, including any modifications needed to the equipment to provide these capabilities. For projects

involving upgrading of existing equipment, an assessment of the existing condition and operating capabilities of that equipment must be included below in Section C, "Description of Existing Major Earthquake Engineering Research Equipment." Describe the overall equipment acquisition process and if the purchased equipment will require modifications or construction.

Discuss the qualifications of the equipment design team and its past experience with similar designs. Cite major equipment designs/installations by the design team in the past five years.

State the specific location (e.g., host site) where the equipment will be housed, either at the host institution or elsewhere (e.g., for field installations), and how this location will be accessible to faculty and students at the host institution and nationally to users outside the host institution. Provide a statement of why the equipment is severable or nonseverable from the facility where it will be housed. The host institution and, if necessary, the host site must commit, in letter(s) signed by authorized organizational representative(s), to the allocation of space and infrastructure on its campus/site for housing and operating the NEES equipment and to providing national, shared-use access to the NEES equipment by the earthquake engineering research community through September 30, 2014. All letters are to be included in Appendix 1.

Section C. Description of Existing Major Earthquake Engineering Research Equipment (up to 5 pages). Describe any existing major equipment (see Table 1 for examples of major equipment) currently used at the host institution for earthquake engineering research and education (e.g., description of equipment, site history, equipment administration, research areas, teleobservation and teleoperation capabilities, access and transportation, automated data acquisition systems, data management, communications, staff, and other items of interest). Information on annual equipment usage and downtime should be included for the past five years. Pertinent data on income from, and cost of, equipment services for the preceding two years, including user charges, salaries of support personnel, maintenance contracts, shop charges, and other expenses, should be included.

Describe the research and educational use of this major equipment during the past five years: annual number of faculty and student use days; research projects supported and impact of experimental results; courses (both academic and public) conducted; special activities hosted (e.g., workshops and conferences); and number of journal publications, master's theses, and doctoral dissertations that cited use of the equipment. The number of postdoctorates, graduate students, and undergraduate students whose research and education-related activities have made use of the equipment should also be estimated for each year of the past five years.

Section D. Project Management and Schedule (up to 3 pages). Describe the project management plan, structure, and schedule. List the members of the project management team and their qualifications. The project schedule should extend from October 1, 2000 to September 30, 2004. Provide a Gantt chart and identify

milestones and major deliverables. Include milestones associated with establishment of the high performance connection at the equipment installation, corresponding to the descriptions provided in Appendix 4. Discuss how the project team will perform cost, schedule, and quality control and subaward and consultant management. Identify any risks associated with this project and discuss the strategy planned to manage these risks.

Section E. Construction, Installation, and Commissioning (up to 3 pages). Include the two subsections below.

Plans. This section of the proposal should describe all construction activities necessary to complete the proposed equipment installation, defining the basis for cost and project scope (including space, utilities, and communications). Discuss the plan to complete final design, construction, and installation; provide an analysis of problems to be overcome; and provide an analysis of constructability. Identify milestone points for evaluation of construction progress. Discuss the plan for commissioning, including personnel who will conduct the commissioning.

Experience. Describe pertinent (e.g., similar-scale research equipment) construction, installation, commissioning, and management experience at the host institution in the past five years, concentrating on pertinent experience of members of the management team, in particular the principal investigator and co-principal investigator(s). Briefly describe the experience of the equipment and construction contractors identified as subawardees. Provide details on pertinent projects in the past five years by such contractors in Appendix 2.

Section F. Equipment Management and Operation (up to 3 pages). Describe the management plan for post-construction operation of the proposed equipment installation and of the facility/site where it is located. Include a schedule for operation of the equipment through September 30, 2004. Discuss the organizational structure and identify responsibilities for specific individuals involved in operation (include their curriculum vitae in the "Biographical Sketches" section). Indicate the annual percentage of time to be devoted by each individual to the operation of the NEES equipment. Provide a plan for assessing equipment performance and management through September 30, 2004.

Section G. Shared-Use, Teleobservation, and Teleoperation (up to 2 pages). Describe how the equipment will be remotely observed and remotely operated. Estimate the annual percentage of time, through September 30, 2014, that the equipment will be scheduled for: research by host institution investigators, shared-use access by researchers outside the host institution, training on equipment usage, and routine maintenance. Proposers should note, however, that training activities and shared-use access will be coordinated and implemented by the NEES Consortium. If user fees are involved in the plan for equipment operation through September 30, 2004, describe how the fees will be established.

Section H. Information Management (up to 2 pages). Data derived from NEES equipment must be made widely available in a timely manner. Describe the information management system and standards in current use in earthquake engineering research at the host institution, and the plan for information management during operation of the NEES equipment. Describe how the data management activity will be implemented in the design of research projects, the mechanisms to be employed to ensure that researchers contribute their data to the NEES databases, and the criteria to be used to establish target dates for researchers to release data to the NEES databases. See the section below on “NEES Data Policy.”

Section I. Education and Training (up to 2 pages). Describe plans to integrate the equipment into educational activities at the host institution, involving both undergraduate and graduate students. Describe the training that would be needed by potential users of this equipment and the staff who would conduct such training.

Section J. Technology Transfer (up to 2 pages). Describe past, current, and planned mechanisms to transfer new knowledge or technology to colleagues in academe, industry or governmental organizations, to public and private owners, and to the public. Describe existing national and international technology transfer collaborations and plans to develop future collaborations that would capitalize on the unique resource created by the requested NEES equipment.

- **References Cited (GPG, Section II.D.5).**
- **Biographical Sketches (GPG, Section II.D.6).** To aid NSF program officers in identifying conflicts of interest that must be avoided during the merit review process, at the front of this section provide one consolidated and alphabetized composite list of all collaborators for all personnel whose biographical sketches are included in this section, including all collaborations associated with activities during the past five years. This composite list should then be followed by biographical sketches (limited to two pages each) of the principal investigator, co-principal investigator(s), and the other project participants listed in the “List of All Project Participants” above. Provide an additional one-page biographical sketch for each person responsible for the operation and technical support of the proposed equipment installation if that person is not among those identified above. The composite list of all collaborators and the biographical sketches are not part of the Project Description page limit. Do not include copies of publications or any other information beyond the material requested in this section.
- **Budget (GPG, Section II.D.7, NSF Form 1030).** This section is the NSF budget request. Provide cumulative and annual budgets through September 30, 2004, including all subaward budgets, on NSF Form 1030. The budget justification, which must not exceed three pages, should itemize and explain all project costs assigned to NSF. The NSF budget request should indicate the costs for design, purchase, construction, installation, commissioning, and operation of the requested equipment

through September 30, 2004. The NSF budget request should include an estimated provision for travel by the principal investigator to two NSF NEES meetings per year through September 30, 2004. Any cost sharing listed on line M of the NSF Form 1030 will be a condition of the award if an award is made. Appendix 3 is to contain detailed information for the total cost estimation for the project, which includes costs assigned to NSF and those assigned to all other sources. The budget and detailed information on the costs for site-specific local networking equipment should not be included in the budget estimates assigned to NSF or to any other sources. Rather, these estimated costs are to be included in Appendix 4 as an information item.

- **Current and Pending Support (GPG, Section II.D.8, NSF Form 1239).** Two types of information must be included using NSF Form 1239. First, use NSF Form 1239 to provide information about all current and pending support, including support from all sources in the past five years, for support, repair, renovation, replacement, and construction of any existing equipment requested to be upgraded as well as for existing major equipment at the host institution (see Table 1 for examples of major equipment). Second, summarize current and pending support for each principal and co-principal investigator on a separate NSF Form 1239 for each investigator.
- **Facilities, Equipment, and Other Resources (GPG, Section II.D.9, NSF Form 1363).** Provide a facilities statement as described in GPG, Section II.D.9. Equipment described in Section C, "Description of Existing Major Earthquake Engineering Research Equipment," of the proposal does not need to be described again in this section. Make explicit reference to the current location, condition, use, etc., of any related equipment purchased by the host institution under NSF equipment grants in the past five years. Describe other resources, including existing technician positions and their source of funding.
- **Appendices (GPG, Section II.D.11).** The proposal must include the four appendices identified below, and not exceed the specified page limit for each appendix. Figures, including charts, graphs, maps, photographs, and other pictorial presentations, are included in the page limit specified for each appendix. Non-conforming proposals will be returned without review.

Appendix 1. Conceptual Design (up to 12 pages) and Letter(s) of Commitment from Host Institution, and if Necessary, Host Site (letter(s) are not included in page limit). Include site plans, floor plans, laboratory infrastructure improvements, and structural design and drawings. Include a detailed listing of the design criteria and performance specifications of the equipment. If the proposal involves upgrading of existing major equipment, include more detailed assessment of the current condition of such equipment than provided above in Section C, "Description of Existing Major Earthquake Engineering Research Equipment." Provide a detailed breakdown of the components of any complex equipment. Clearly justify each component. If a specific manufacturer and model has been selected, explain why. If a specific component has not been selected in advance, describe those components that are of interest, their costs, and the methods that will be used to make the final

selection. It is appropriate to request multiple pieces of equipment related by a common purpose, but a "shopping list" of unrelated items is not advised. Proposers are encouraged to consider the most cost-effective approach to obtaining equipment that has the capability of teleoperation. Discuss how the equipment will be designed, selected, and installed to minimize operating costs. Identify any major repairs or major maintenance that may be needed to keep the equipment operational through September 30, 2014. The host institution and, if necessary, the host site must commit, in letter(s) signed by authorized organizational representative(s), to the allocation of space and infrastructure on its campus/site for housing and operating the NEES equipment and to providing national, shared-use access to the NEES equipment by the earthquake engineering research community through September 30, 2014. These letter(s) of commitment must be included at the end of this Appendix.

Appendix 2. Equipment and Construction Contractors Past Experience (up to 5 pages). Provide documentation of equipment and construction contractors performance on similar projects in the past five years.

Appendix 3. Total Cost Estimation (up to 15 pages). Submit a one-page detailed budget spreadsheet for each year of the project and a one-page detailed cumulative year budget spreadsheet. On each annual and the cumulative spreadsheet, in the left-most column, list the NSF Form 1030 categories. The NSF Form 1030 categories should be subdivided to provide detailed information for items such as personnel support, equipment components, and subaward information. The next columns on each spreadsheet should be: amount requested from NSF, institutional cost sharing (if any), and other support (e.g., State appropriations, industry, other private funds, if any). Identify all sources of other support. For requested equipment, include actual equipment costs, not merely a nominal quote. Include discounts available for the total equipment package requested, itemized by major components. Institutional procurement policies should be pursued as far as feasible before submission of the proposal so that the request can be considered on current and realistic information. Explain the basis for all cost estimates. Include vendor quotations. Include in this appendix, derived from costs on the above spreadsheets, a table showing both the NSF budget request and the total costs (costs assigned to NSF and all other sources) for the following items: (1) completion of detailed final design; (2) construction, installation, and commissioning; and (3) provision for teleoperation capability. Finally, in a separate table, list estimated annual total costs for operation of the equipment from the date that the equipment is expected to become operational through September 30, 2014. The annual operating costs should be broken down by the following categories: operator, technician, and other support personnel salaries; maintenance contracts; replacement equipment; materials and supplies; shop charges; consultant services; computer services; and other (itemize).

Appendix 4. High Performance Local Networking for the NEES System (up to 4 pages). This appendix requests information and detailed cost estimates for site-specific hardware and software necessary for local networking to achieve the goal of the NEES Program for networking NEES equipment with the NEES collaboratory.

The purpose of the information requested in this Appendix 4 is to assist NSF in determining the extent of need to bring the networking capability of requested NEES equipment sites up to the "reference" networking level described below. Proposers are asked to describe the existing networking environment for the requested NEES equipment, propose what is needed to reach the reference level capability (described below), and estimate the cost of achieving that capability.

In consideration of planned capabilities approaching near-real-time dissemination of readouts from the equipment instrumentation, a "reference" network plan is defined. The reference plan provides at least Gigabit Ethernet speeds from the equipment through to the host institution's Internet interface. This may be staged: the installation itself may be outfitted for Gigabit Ethernet (1-10 Gb/s) initially to provide growth potential, and the host institution's local area network may be upgraded later, if needed, or bypassed to provide a direct connection from the equipment. Internet access and ancillary equipment should be sized to provide a growth path for information transfer from the expected equipment instrumentation data rates (likely to approach Gigabits/second in some instances) to anticipated Gigabit/second wide area networking by 2004 or shortly thereafter. Therefore, in the reference network plan, the host institution's shared Internet access should initially be at least T3 (45 Mb/s), or a private connection directly from the installation to the Internet should initially be at least tens of Mb/s. Gigabit/second access to wide area networking should be achieved by 2004. Initially, over-provisioned networks, such as vBNS, vBNS+ and Abilene, and/or services similar to virtual private networking may be employed to form a community of interest among the NEES community.

Specifically, proposers must provide the following information in this Appendix:

1. Describe the current networking environment available from the requested NEES equipment to the Internet. This includes local networking equipment and the host institution's or host site's access to a high performance network.
2. Describe how the requested equipment will be networked according to the "reference" network plan. Proposals may deviate from the "reference" network plan, but the rationale for doing so must be provided.
3. Provide a cost estimate for upgrading existing or providing new local networking capabilities for the NEES equipment consistent with the "reference" network plan. For field installations, provide a detailed cost estimate to supply high performance Internet connectivity as close to the "reference" network plan as is reasonable and practical. Do not include the cost of the host institution's or host site's access to a high performance network; this is not an eligible project cost under this solicitation.

No other attachments or appendix material will be permitted. Proposals that include other appendices or other material, except material specifically permitted in this solicitation, will be returned without review.

B. Budgetary Information: Cost Sharing Requirements

There is no specific cost sharing requirement under this solicitation. However, proposers should review the eligibility requirements, which will result in institutional commitments of resources through 2014.

C. Letters of Intent Due Date

Letters of intent are required and must be received at NSF by e-mail to nees@nsf.gov by March 31, 2000. Submission of a letter of intent is required for each proposal planned to be submitted by an institution to this solicitation.

D. Proposal Due Date

The original paper proposal plus 20 paper copies of the proposal must be received by 5:00 PM, ET, May 11, 2000. The copies of the proposal must be made and submitted to NSF according to the normal procedures for paper proposals identified in the GPG.

Proposals will be subjected to initial screening for the requirements in the GPG and the supplemental guidelines described in this solicitation. Proposals will be returned without review if deviations are found. Proposals will not be forwarded to other programs if found to be inappropriate for this solicitation.

E. FastLane Requirements

FastLane submission of the full proposal is not recommended. However, the cover sheet and project summary must be submitted on FastLane prior to paper submission of the proposal. The FastLane cover sheet, with the proposal number generated by FastLane and printed on the cover sheet, and the project summary must be included with the original and 20 copies of the paper submission. Instructions for FastLane cover sheet and project summary submission are available at <<https://www.fastlane.nsf.gov/a1/newstan.htm>>. For paper submission of proposals, proposers should follow submission instructions contained in the NSF Grant Proposal Guide (GPG) (NSF 00-2) Section 1.F.

PROPOSAL REVIEW INFORMATION

A. NSF Merit Review Criteria

Reviews of proposals submitted to NSF are solicited from peers with expertise in the substantive area of the proposed research or education project. These reviewers are selected by Program Officers charged with the oversight of the review process. NSF invites the proposer to suggest, at the time of submission, the names of appropriate or inappropriate reviewers. Care is taken to ensure that reviewers have no conflicts with the proposer. Special efforts are made to recruit reviewers from non-academic institutions,

minority serving institutions, or adjacent disciplines to that principally addressed in the proposal.

Proposals will be reviewed against the following general merit review criteria established by the National Science Board. Following each criterion are potential considerations that the reviewer may employ in the evaluation. These are suggestions and not all will apply to any given proposal. Each reviewer will be asked to address only those that are relevant to the proposal and for which he/she is qualified to make judgments.

What is the intellectual merit of the proposed activity?

How important is the proposed activity to advancing knowledge and understanding within its own field or across different fields? How well qualified is the proposer (individual or team) to conduct the project? (If appropriate, the reviewer will comment on the quality of prior work.) To what extent does the proposed activity suggest and explore creative and original concepts? How well conceived and organized is the proposed activity? Is there sufficient access to resources?

What are the broader impacts of the proposed activity?

How well does the activity advance discovery and understanding while promoting teaching, training, and learning? How well does the proposed activity broaden the participation of underrepresented groups (e.g., gender, ethnicity, disability, geographic, etc.)? To what extent will it enhance the infrastructure for research and education, such as facilities, instrumentation, networks, and partnerships? Will the results be disseminated broadly to enhance scientific and technological understanding? What may be the benefits of the proposed activity to society?

PIs should address the following elements in their proposal to provide reviewers with the information necessary to respond fully to both NSF merit review criteria. NSF staff will give these factors careful consideration in making funding decisions.

Integration of Research and Education

One of the principal strategies in support of NSF's goals is to foster integration of research and education through the programs, projects, and activities it supports at academic and research institutions. These institutions provide abundant opportunities where individuals may concurrently assume responsibilities as researchers, educators, and students and where all can engage in joint efforts that infuse education with the excitement of discovery and enrich research through the diversity of learner perspectives.

Integrating Diversity into NSF Programs, Projects, and Activities

Broadening opportunities and enabling the participation of all citizens -- women and men, underrepresented minorities, and persons with disabilities -- is essential to the health

and vitality of science and engineering. NSF is committed to this principle of diversity and deems it central to the programs, projects, and activities it considers and supports.

Additional Merit Review Criteria Specific to This Solicitation

In addition to the standard NSF Merit Review Criteria, the reviewers of NEES research equipment proposals will be required to consider the following supplemental merit review criteria specific to the NEES Program:

- **Vision and Impact**

1. Does the requested equipment provide next-generation experimental capabilities and instrumentation over the portfolio of existing experimental earthquake engineering research equipment in the United States?
2. Is there a compelling research vision for integrated experimentation with the requested NEES equipment, computation, theory, databases, and model-based simulation that can lead to significant advances in the seismic design and performance of our Nation's civil and mechanical systems?
3. Will the equipment have a strong impact on experimental research capabilities of the proposing investigators at the host institution and more generally of the earthquake engineering research community?
4. Does the plan for integrating the equipment into educational activities at the host institution provide opportunities for undergraduate and graduate students to use the equipment for research projects?
5. Has the host institution provided a comprehensive evaluation of needed training activities and sufficient annual equipment time for training activities on the use of the equipment for researchers outside the host institution?
6. Does the equipment significantly expand the breadth of the overall NEES equipment portfolio?

- **Equipment**

1. Is the design well-conceived? Are the equipment and equipment component choices appropriate for the design?
2. Are the risks well-assessed and managed so that it is likely that the equipment will be operational on or before September 30, 2004?
3. Are the issues of planning, design, equipment selection, construction, installation, and commissioning properly addressed?

4. Does the equipment design, selection, and installation minimize operating costs?
5. Does the equipment design provide for potentially effective and feasibly complete teleobservation and teleoperation capabilities?

- **Budget**

1. Is the itemized budget detailed enough for proper evaluation?
2. Is the budget realistic and properly justified?
3. Are the percentages of the budget that are applied to design, construction, installation, commissioning, and operation appropriate?

- **Leadership and Management**

1. Have the host institution and principal and co-principal investigators adequately used and maintained existing major equipment (see Table 1 for examples of major equipment) for earthquake engineering research at the host institution?
2. Do the principal investigator, co-principal investigators, and other project personnel have the experience, capability, and commitment to manage this project in terms of the equipment design, construction, installation, commissioning, operation, shared-use access, teleobservation, teleoperation, and training and to conduct the proposed research once the equipment is operational?
3. Does the proposal contain a good and realistic project management plan, including cost, schedule, milestones, and quality control, over the duration of the project?
4. Does the proposal contain a good and realistic plan for operation through September 30, 2004?
5. Does the management plan demonstrate that the team members, including subawardees and consultants, will effectively collaborate, coordinate, and accomplish all phases of the proposed equipment project?
6. Is there adequate commitment(s) from the host institution and, if necessary, the host site to allocate space and infrastructure on its campus/site for housing and operating the NEES equipment and to providing national, shared-use access to the NEES equipment by the earthquake engineering research community through September 30, 2014?

B. Review Protocol and Associated Customer Service

All proposals are carefully reviewed by at least three other persons outside NSF who are experts in the particular field represented by the proposal. Proposals submitted in

response to this solicitation will be reviewed by panels, but ad hoc mail reviews may also be used. Reviewers will include experts from the earthquake engineering community, the networking and software industry, and other appropriate fields.

Proposals will first be reviewed by Category Technical Review Panels, who will consider proposals by equipment category (see Table 1 of this solicitation) and prepare recommendations of proposals to be considered further in each category. An Equipment Portfolio Review Panel will meet after the Category Technical Review Panels and will consider all proposals recommended by the Category Technical Review Panels. The Equipment Portfolio Review Panel will prepare a composite recommendation from among those proposals and NSF will consider this composite recommendation in formulating the recommendation for the NEES Program Phase 1 portfolio for NEES earthquake engineering research equipment.

Reviewers will be asked to formulate a recommendation to either support or decline each proposal. A program officer assigned to manage the proposal's review will consider the advice of reviewers and will formulate a recommendation. In most cases, proposers will be contacted by the program officer after his or her recommendation to award or decline funding has been approved by the division director. This informal notification is not a guarantee of an eventual award. NSF will be able to tell applicants whether their proposals have been declined or recommended for funding within six months for 95 percent of proposals. The time interval begins on the proposal deadline or target date or from the date of receipt, if deadlines or target dates are not used by the program. The interval ends when the division director accepts the program officer's recommendation.

In all cases, after programmatic approval has been obtained, the proposals recommended for funding will be forwarded to the Division of Grants and Agreements for review of business, financial, and policy implications and the processing and issuance of a grant or other agreement. Proposers are cautioned that only a Grants Officer may make commitments, obligations or awards on behalf of NSF or authorize the expenditure of funds. No commitment on the part of NSF should be inferred from technical or budgetary discussions with an NSF Program Officer. A principal investigator or organization that makes financial or personnel commitments in the absence of a grant or cooperative agreement signed by the NSF Grants Officer does so at its own risk.

AWARD ADMINISTRATION INFORMATION

A. Notification of the Award

Notification of the award is made *to the submitting organization* by a Grants Officer in the Division of Grants and Agreements. Organizations whose proposals are declined will be advised as promptly as possible by the cognizant NSF Program Division administering the program. Verbatim copies of reviews, not including the identity of the reviewer, will be provided automatically to the Principal Investigator.

B. Grant Award Conditions

An NSF grant consists of: (1) the award letter, which includes any special provisions applicable to the grant and any numbered amendments thereto; (2) the budget, which indicates the amounts, by categories of expense, on which NSF has based its support (or otherwise communicates any specific approvals or disapprovals of proposed expenditures); (3) the proposal referenced in the award letter; (4) the applicable grant conditions, such as Grant General Conditions (NSF GC-1)* or Federal Demonstration Partnership Phase III (FDP III) Terms and Conditions;* and (5) any NSF brochure, program guide, announcement, or other NSF issuance that may be incorporated by reference in the award letter. Cooperative agreement awards are also administered in accordance with the NSF Cooperative Agreement Terms and Conditions (CA-1).^{*} Electronic mail notification is the preferred way to transmit NSF grants to organizations that have electronic mail capabilities and have requested such notification from the Division of Grants and Agreements. The title to equipment purchased or fabricated by a U.S. university or college with NSF grant funds shall vest in the awardee upon acquisition. The equipment must remain in use for the NEES Program in accordance with Office of Management and Budget Circular A-110, Subpart C, Section .34 <<http://www.whitehouse.gov/OMB/circulars/a110/a110.html>>. In this context, the NEES Program is considered to extend from the date of a NEES research equipment award through September 30, 2014.

* These documents may be accessed electronically on NSF's Web site at: <<http://www.nsf.gov/>>. Paper copies may be obtained from the NSF Publications Clearinghouse, telephone 301.947.2722 or by e-mail from pubs@nsf.gov.

More comprehensive information on NSF Award Conditions is contained in the NSF *Grant Policy Manual* (GPM) Chapter II, (NSF 95-26), available electronically on the NSF Web site. The GPM also is available in paper copy by subscription from the Superintendent of Documents, Government Printing Office, Washington, DC 20402. The GPM may be ordered through the GPO Web site at: <<http://www.gpo.gov/>>. The telephone number at GPO for subscription information is 202.512.1800.

C. Reporting Requirements

For all multi-year grants (including both standard and continuing grants), the PI must submit an annual project report to the cognizant Program Officer at least 90 days before the end of the current budget period. Awardees will be required to report on award performance milestones as specified in the grant letter or cooperative agreement and to document and report annual operating costs through September 30, 2004.

Within 90 days after expiration of a grant, the PI also is required to submit a final project report. Approximately 30 days before expiration, NSF will send a notice to remind the PI of the requirement to file the final project report. Failure to provide final technical reports delays NSF review and processing of pending proposals for that PI. PIs should

examine the formats of the required reports in advance to assure availability of required data.

NSF has implemented a new electronic project reporting system, available through FastLane, which permits electronic submission and updating of project reports, including information on: project participants (individual and organizational); activities and findings; publications; and, other specific products and contributions. Reports will continue to be required annually and after the expiration of the grant, but PIs will not need to re-enter information previously provided, either with the proposal or in earlier updates using the electronic system.

Effective October 1, 1999, PIs are required to use the new reporting system for submission of annual and final project reports.

D. New Awardee Information

If the submitting organization has never received an NSF award, it is recommended that the organization's appropriate administrative officials become familiar with the policies and procedures in the NSF *Grant Policy Manual* which are applicable to most NSF awards. The "Prospective New Awardee Guide" (NSF 99-78) includes information on: Administration and Management Information; Accounting System Requirements and Auditing Information; and Payments to Organizations with NSF Awards. This information will assist an organization in preparing documents that NSF requires to conduct administrative and financial reviews of an organization. The guide also serves as a means of highlighting the accountability requirements associated with Federal awards. This document is available electronically on NSF's Web site at: <<http://www.nsf.gov/cgi-bin/getpub?nsf9978>>.

E. Award Oversight

NSF may conduct annual site visit merit reviews of the progress and plans of cooperative agreement awardees. The external site visit team will consist of experts from the earthquake engineering research community, the networking and software industry, and other appropriate fields. NSF expects all NEES equipment awardees to work closely with the NEES System Integration awardee funded under program solicitation NSF 00-7, "NEES: System Integration," the NEES Consortium awardee funded under program solicitation NSF 01-56, "NEES: Consortium," and to participate in activities of the NEES Consortium, when established, through September 30, 2014.

F. NEES Data Policy

As a general policy, NSF will require submission of NEES-related NSF-supported data, derived data products, samples, physical collections, and other supported materials to the NEES collaborative research data centers and other specified repositories. NSF expects investigators to share data and information on experiments with other researchers at no more than incremental cost and within a reasonable time. Investigators should be prepared to work with the NEES System Integration awardee to establish standards and

to require application of such standards for collection, processing, and communication of NSF-sponsored data sets.

CONTACTS FOR ADDITIONAL INFORMATION

To ensure that all proposers receive the same information, all questions concerning this solicitation, except for those related to FastLane, will be accepted only by e-mail. Please e-mail questions to nees@nsf.gov and include in the heading "RESEARCH EQUIPMENT SOLICITATION." All questions, except for those related to FastLane, must be received at NSF by March 31, 2000. NSF will post the responses of interest to all proposers on the NSF NEES FAQ web site at: <http://www.eng.nsf.gov/nees>. For questions related to use of FastLane, contact FastLane User Support, (703) 306-1142, fastlane@nsf.gov.

Within the Directorate for Engineering, the Division of Civil and Mechanical Systems will administer the NEES Program. The NSF NEES Program Team is as follows:

Dr. Joy Pauschke, NEES Program Director, Directorate for Engineering, telephone (703) 306-1380, e-mail: nees@nsf.gov.

Dr. Steven N. Goldstein, Senior Advisor for Information Technology, Directorate for Engineering, telephone (703) 306-1349, e-mail: nees@nsf.gov.

Dr. Priscilla P. Nelson, Director, Division of Civil and Mechanical Systems, telephone (703) 306-1361, e-mail: nees@nsf.gov.

OTHER PROGRAMS OF INTEREST

The NSF Guide to Programs is a compilation of funding for research and education in science, mathematics, and engineering. General descriptions of NSF programs, research areas, and eligibility information for proposal submission are provided in each chapter. Many NSF programs offer announcements concerning specific proposal requirements. To obtain additional information about these requirements, contact the appropriate NSF program offices listed in Appendix A of the GPG. Any changes in NSF's fiscal year programs occurring after press time for the Guide to Programs will be announced in the NSF Bulletin, available monthly (except July and August), and in individual program announcements. The Bulletin is available electronically via the NSF Web Site at <http://www.nsf.gov>. The direct URL for recent issues of the Bulletin is <http://www.nsf.gov/od/lpa/news/publicat/bulletin/bulletin.htm>. Subscribers can also sign up for NSF's Custom News Service to find out what funding opportunities are available.

ABOUT THE NATIONAL SCIENCE FOUNDATION

The National Science Foundation (NSF) funds research and education in most fields of science and engineering. Grantees are wholly responsible for conducting their project activities and preparing the results for publication. Thus, the Foundation does not assume responsibility for such findings or their interpretation.

NSF welcomes proposals from all qualified scientists, engineers and educators. The Foundation strongly encourages women, minorities, and persons with disabilities to compete fully in its programs. In accordance with federal statutes, regulations, and NSF policies, no person on grounds of race, color, age, sex, national origin, or disability shall be excluded from participation in, be denied the benefits of, or be subjected to discrimination under any program or activity receiving financial assistance from NSF (unless otherwise specified in the eligibility requirements for a particular program).

Facilitation Awards for Scientists and Engineers with Disabilities (FASSED) provide funding for special assistance or equipment to enable persons with disabilities (investigators and other staff, including student research assistants) to work on NSF-supported projects. See the program announcement or contact the program coordinator at (703) 306-1636.

The National Science Foundation has Telephonic Device for the Deaf (TDD) and Federal Information Relay Service (FIRS) capabilities that enable individuals with hearing impairments to communicate with the Foundation regarding NSF programs, employment, or general information. TDD may be accessed at (703) 306-0090 or through FIRS on 1-800-877-8339.

We want all of our communications to be clear and understandable. If you have suggestions on how we can improve this document or other NSF publications, please email us at plainlanguage@nsf.gov.

PRIVACY ACT AND PUBLIC BURDEN STATEMENTS

The information requested on proposal forms and project reports is solicited under the authority of the National Science Foundation Act of 1950, as amended. The information on proposal forms will be used in connection with the selection of qualified proposals; project reports submitted by awardees will be used for program evaluation and reporting within the Executive Branch and to Congress. The information requested may be disclosed to qualified reviewers and staff assistants as part of the review process; to applicant institutions/grantees to provide or obtain data regarding the proposal review process, award decisions, or the administration of awards; to government contractors, experts, volunteers and researchers and educators as necessary to complete assigned work; to other government agencies needing information as part of the review process or in order to coordinate programs; and to another Federal agency, court or party in a court or Federal administrative proceeding if the government is a party. Information about

Principal Investigators may be added to the Reviewer file and used to select potential candidates to serve as peer reviewers or advisory committee members. See Systems of Records, NSF-50, "Principal Investigator/Proposal File and Associated Records," 63 Federal Register 267 (January 5, 1998), and NSF-51, "Reviewer/Proposal File and Associated Records," 63 Federal Register 268 (January 5, 1998). Submission of the information is voluntary. Failure to provide full and complete information, however, may reduce the possibility of receiving an award.

Public reporting burden for this collection of information is estimated to average 120 hours per response, including the time for reviewing instructions. Send comments regarding this burden estimate and any other aspect of this collection of information, including suggestions for reducing this burden, to: Reports Clearance Officer; Information Dissemination Branch, DAS; National Science Foundation; Arlington, VA 22230.

YEAR 2000 REMINDER

In accordance with Important Notice No. 120 dated June 27, 1997, Subject: Year 2000 Computer Problem, NSF awardees are reminded of their responsibility to take appropriate actions to ensure that the NSF activity being supported is not adversely affected by the Year 2000 problem. Potentially affected items include: computer systems, databases, and equipment. The National Science Foundation should be notified if an awardee concludes that the Year 2000 will have a significant impact on its ability to carry out an NSF funded activity. Information concerning Year 2000 activities can be found on the NSF web site at <http://www.nsf.gov/oirm/y2k/start.htm>.

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